

### ABSTRACT

A system for the compression and decompression of image files is provided. A library of basic waveforms is produced by applying selected digital initialization codes to a chaotic system. Each basic waveform is in one-to-one correspondence with an initialization code. A weighted sum of selected basic waveforms is used to approximate each slice of an image. The basic waveforms are then discarded and only the weighting factors and the corresponding initialization codes are stored in a compressed image file. When the compressed image file is decompressed for playback, the stored initialization codes are stripped out and applied to a similar chaotic system to regenerate the basic waveforms, which are recombined according to the stored weighting factors to produce an approximation of the original image slice.

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